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| EXAMINER | |
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| SAEED, USMAAN | |
| **ART UNIT** | **PAPER NUMBER** |
| 2166 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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| 3 MONTHS | 03/19/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/618,410 | DETTINGER ET AL. | |
| | Examiner | Art Unit | |
| | Usmaan Saeed | 2166 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,4-20 and 23-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-20, and 23-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's request for reconsideration, filed on 1/04/2007 is acknowledged.

Claims 1, 7, 15, 20, 23-42 have been amended. Claims 2-3 and 21-22 have been cancelled.

### *Claim Rejections - 35 USC § 101*

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-41 are still rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. The language of the claims raises a question as to whether the claims are directed merely to an environment or machine which would result in a practical application producing a concrete useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101.

Claims 1-41 are rejected because the claims do not recite a practical application by producing a physical transformation or producing a useful, concrete, and tangible results. To perform a physical transformation, the claimed invention must transform an article of physical object into a different state or thing. Transformation of data is not a

physical transformation. A useful, concrete, and tangible results must be either specifically recited in the claim or flow inherently therefrom. To be useful the claimed invention must establish a specific, substantial, and credible utility. To be concrete the claimed invention must be able to produce reproducible results. To be tangible the claimed invention must produce a practical application or real world result.

Claim 42 is producing a tangible result since there is an output specifying when to execute the query, therefore the 101 rejections for this claim have been withdrawn.

To expedite a complete examination of the instant application the claims rejected under U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of application amending these claims to place them within the four categories of invention.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 10-12, 15-17, 20-26, 29-31, 34-36, and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Snodgrass et al**. (U.S. PG Pub No. 2004/0117359), in view of **Rubert et al**. (**Rubert** hereinafter) (US Patent No. 6,366,915).

With respect to claim 1, **Snodgrass** teaches **a computer implemented method for managing query execution in a data processing system, comprising:**

**"providing at least one query execution schedule configured to schedule specific queries against a database in the data processing system"** as a set of candidate algebraic query plans is produced by means of the optimizer's transformation rules and heuristics. Next, the optimizer considers in more detail each of these plans. For each algebraic operation in a plan, it assumes that each of the algorithms available for computing that operation is being used, and it estimates the consequent cost of computing the query. This way, one best physical query execution plan, where all operations are specified by algorithms, is found for each original candidate plan (**Snodgrass** Paragraph 0028). Therefore one of the best plan/schedule is being chosen for the execution of a query.

**"wherein at least one query execution schedule is stored in a storage medium and defines query eligibility criteria identifying specific queries"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass** Paragraph 0016). **"and a timeframe available for executing the specific queries"** as means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020).

**"receiving a query against the database"** as a user application layer for interaction between the user and said database-based application for entering queries, a middleware layer overlying a Database Management System (DBMS) and said middleware layer being intended for processing temporal queries from the user, a Database Management System (DBMS) layer for processing queries and for accessing data in a database (**Snodgrass** Paragraph 0015).

**"determining that the received query satisfies at least a portion of the query eligibility criteria of the at least one query execution schedule"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (Snodgrass Paragraph 0016).

**"scheduling a time to execute the received query on the basis of the at least one query execution schedule"** as a set of candidate algebraic query plans is produced by means of the optimizer's transformation rules and heuristics. Next, the optimizer considers in more detail each of these plans. For each algebraic operation in a plan, it assumes that each of the algorithms available for computing that operation is being used, and it estimates the consequent cost of computing the query. This way, one best physical query execution plan, where all operations are specified by algorithms, is found for each original candidate plan (**Snodgrass** Paragraph 0028). Therefore one of the best plan/schedule is being chosen for the execution of a query.

**Snodgrass** teaches the elements of claim 1 as noted above but does not explicitly teaches, **"scheduling a time to execute the received query on the basis of the timeframe of at least one query execution schedule."**

However, **Rubert** discloses **"scheduling a time to execute the received query on the basis of the timeframe of at least one query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's** teaching would have allowed **Snodgrass** to provide an efficient retrieval of information

from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

Claims 20, 39, and 42 are essentially the same as claim 1 except they set forth the claimed invention as a computer readable medium containing a program, a system and a data structure and are rejected for the same reasons as applied hereinabove.

With respect to claim 4, **Snodgrass** teaches **the method of claim 3, wherein the query eligibility criteria comprise at least one of:**

**"an estimated amount of resources required for execution of the specific queries"** as the cost effective query plans can be chosen, avoiding that query plans demanding large resources compared to other plans are chosen. The resources could comprise the IO resources and CPU resources (**Snodgrass** Paragraph 0017).

**an availability of data sources accessed by the specific queries**

**"a user submitting the specific queries**

**and an application submitting the specific queries"** as a user application layer for interaction between the user and said database-based application for entering queries, a middleware layer overlying a Database Management System (DBMS) and said middleware layer being intended for processing temporal queries from the user, a Database Management System (DBMS) layer for processing queries and for accessing data in a database (**Snodgrass** Paragraph 0015). Therefore a user and an application are submitting the queries together.

Claims 10, 16, 23, 29, and 35 are same as claim 4 except claims 23, 29 and 35 set forth the claimed invention as a computer readable medium containing a program and are rejected for the same reasons as applied hereinabove.

With respect to claim 5, **Snodgrass** teaches **"the method of claim 1, wherein the at least one query execution schedule is statically defined by a human operator"** as generating a number of query plans according to queries having been entered by the user by means of said user application layer, each said query plan specifying combinations of operations to be performed and establishing whether the operation should be performed in the middleware layer or the DBMS layer (**Snodgrass** Paragraph 0016). Therefore the operations to be performed are specified by the user in the queries.

**Snodgrass** teaches the elements of claim 5 as noted above but does not explicitly teaches, **"query execution schedule."**

However, **Rubert** discloses **"query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's**

teaching would have allowed **Snodgrass** to provide an efficient retrieval of information from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

Claims 11, 24, and 30 are same as claim 5 except claims 24 and 30 set forth the claimed invention as a computer readable medium containing a program and are rejected for the same reasons as applied hereinabove.

With respect to claim 6, **Snodgrass** teaches **"the method of claim 1, wherein the at least one query execution schedule is dynamically defined by the data processing system on the basis of monitored system parameters"** as FIG. 2 describes the main function of the Execution Engine, which receives an execution-ready plan consisting of a sequence of algorithms with their parameters and arguments (**Snodgrass** Paragraph 0032).

**Snodgrass** teaches the elements of claim 6 as noted above but does not explicitly teaches, **"query execution schedule."**

However, **Rubert** discloses **"query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's** teaching would have allowed **Snodgrass** to provide an efficient retrieval of information from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

Claims 12, 25, and 31 are same as claim 6 except claims 25 and 31 set forth the claimed invention as a computer readable medium containing a program and are rejected for the same reasons as applied hereinabove.

With respect to claim 7, **Snodgrass** teaches **a computer-implemented method for scheduling execution of a query against a database in a data processing system, comprising:**

**"providing a plurality of query execution schedules"** as a set of candidate algebraic query plans is produced by means of the optimizer's transformation rules and heuristics. Next, the optimizer considers in more detail each of these plans. For each algebraic operation in a plan, it assumes that each of the algorithms available for computing that operation is being used, and it estimates the consequent cost of computing the query. This way, one best physical query execution plan, where all operations are specified by algorithms, is found for each original candidate plan (**Snodgrass** Paragraph 0028). Therefore one of the best plan/schedule is being

chosen for the execution of a query. **"each query execution schedule defining query eligibility criteria identifying specific queries"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass** Paragraph 0016). **"and a timeframe available for executing the specific queries"** as means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020).

**"receiving a query against the database"** as a user application layer for interaction between the user and said database-based application for entering queries, a middleware layer overlying a Database Management System (DBMS) and said middleware layer being intended for processing temporal queries from the user, a Database Management System (DBMS) layer for processing queries and for accessing data in a database (Snodgrass Paragraph 0015).

**"determining, for the received query, a suitable query execution schedule on the basis of the query eligibility criteria of the plurality of query execution schedules"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass** Paragraph 0016).

**"scheduling execution of the received query against the database on the basis of the timeframe defined by the suitable query execution schedule"** as

means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020).

**Snodgrass** teaches the elements of claim 7 as noted above but does not explicitly teach, **"scheduling execution of the received query against the database on the basis of the timeframe defined by the suitable query execution schedule."**

However, **Rubert** discloses **"scheduling execution of the received query against the database on the basis of the timeframe defined by the suitable query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's** teaching would have allowed **Snodgrass** to provide an efficient retrieval of information from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

Claims 26 and 40 are essentially the same as claim 7 except they set forth the claimed invention as a computer readable medium containing a program and a system and are rejected for the same reasons as applied hereinabove.

With respect to claim 15, **Snodgrass** teaches **a computer implemented method of providing a query execution schedule for scheduling execution of specific queries against a database in a data processing system, comprising:**

**"defining query eligibility criteria identifying the specific queries to be scheduled by the query execution schedule"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass** Paragraph 0016).

**"defining a timeframe available for executing the specific queries"** as means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020).

**"associating the query eligibility criteria and the timeframe with the query execution schedule"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass** Paragraph 0016). Means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by

using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020). They are both associated with the query plan/schedule.

**"scheduling times to execute the specific queries against the data processing system on the basis of the query eligibility criteria and the timeframe associated with the query execution schedule"** as means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020). Means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass** Paragraph 0016).

**Snodgrass** teaches the elements of claim 15 as noted above but does not explicitly teaches **"scheduling times to execute the specific queries against the data processing system on the basis of the timeframe and the query execution schedule."**

However, **Rubert** discloses **"scheduling times to execute the specific queries against the data processing system on the basis of the timeframe and the query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate

at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's** teaching would have allowed **Snodgrass** to provide an efficient retrieval of information from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

Claims 34, and 41 are essentially the same as claim 15 except they set forth the claimed invention as a computer readable medium containing a program, and a system and are rejected for the same reasons as applied hereinabove.

With respect to claim 17, **the method of claim 15, further comprising: "monitoring system parameters of the data processing system"** as FIG. 2 describes the main function of the Execution Engine, which receives an execution-ready plan consisting of a sequence of algorithms with their parameters and arguments (**Snodgrass** Paragraph 0032).

**wherein the defining of the query eligibility criteria and the timeframe comprises:**

**"dynamically defining the query eligibility criteria"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass**

Paragraph 0016). **"and the timeframe"** as means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020). **"on the basis of the monitored system parameters"** as FIG. 2 describes the main function of the Execution Engine, which receives an execution-ready plan consisting of a sequence of algorithms with their parameters and arguments (**Snodgrass** Paragraph 0032).

Claim 36 is essentially the same as claim 17 except it sets forth the claimed invention as a computer readable medium containing a program and is rejected for the same reasons as applied hereinabove.

4. Claims 8-9, 13-14, 18-19, 27-28, 32-33, and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Snodgrass et al**. (U.S. PG Pub No. 2004/0117359), in view of **Rubert et al**. (**Rubert** hereinafter) (US Patent No. 6,366,915) as applied to claims 1-7, 10-12, 15-17, 20-26, 29-31, 34-36, and 39-42 above further in view of **Lomet et al**. (**Lomet** hereinafter) (US Patent No. 5,212,788).

With respect to claim 8, **Snodgrass** teaches **the method of claim 7, wherein a plurality of suitable query execution schedules is determined and wherein the scheduling comprises:**

**"timeframes of the plurality of suitable query execution schedules"** as means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020).

**"scheduling execution of the received query against the database"** as a set of candidate algebraic query plans is produced by means of the optimizer's transformation rules and heuristics. Next, the optimizer considers in more detail each of these plans. For each algebraic operation in a plan, it assumes that each of the algorithms available for computing that operation is being used, and it estimates the consequent cost of computing the query. This way, one best physical query execution plan, where all operations are specified by algorithms, is found for each original candidate plan (**Snodgrass** Paragraph 0028). Therefore one of the best plan/schedule is being chosen for the execution of a query.

**Snodgrass** teaches the elements of claim 8 as noted above but does not explicitly teaches, **"query execution schedule."**

However, **Rubert** discloses **"query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's** teaching would have allowed **Snodgrass** to provide an efficient retrieval of information from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

**Snodgrass and Rubert** teach the elements of claim 8 as noted above but do not explicitly disclose the step of **"determining an intersection."**

However, **Lomet** discloses **"determining an intersection"** as a transaction time is selected from the intersection of the voted time ranges and is used to timestamp all updated data that is durably stored when the transaction is committed (**Lomet** Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Lomet's** teaching would have allowed **Snodgrass and Rubert** to facilitate determining the overlap in time of different timeframes, without hurting the system's performance and also providing a delay lock mechanism (**Lomet** Col 1, Lines 50-58).

Claim 27 is essentially the same as claim 8 except it sets forth the claimed invention as a computer readable medium containing a program and is rejected for the same reasons as applied hereinabove.

With respect to claim 9, **Snodgrass** does not explicitly teach **"the method of claim 7, wherein a plurality of suitable query execution schedules is determined and wherein the scheduling comprises:**

**determining an intersection of the timeframes of the plurality of suitable query execution schedules**

**determining whether the intersection is empty or not**

**if the intersection is not empty, scheduling execution of the received query against the database on the basis of the determined intersection**

**if the intersection is empty, notifying a user."**

However, **Rubert** discloses **"query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's** teaching would have allowed **Snodgrass** to provide an efficient retrieval of information from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

**Snodgrass and Rubert** teach elements of claim 9 as noted above but do not explicitly teach the **"determining an intersection of the timeframes of the plurality of suitable query execution schedules**

**determining whether the intersection is empty or not**

**if the intersection is not empty, scheduling execution of the received query against the database on the basis of the determined intersection**

**if the intersection is empty, notifying a user."**

However, **Lomet** discloses **the method of claim 7, wherein a plurality of suitable query execution schedules is determined and wherein the scheduling comprises:**

**"determining an intersection of the timeframes of the plurality of suitable query execution schedules"** as a transaction time is selected from the intersection of the voted time ranges and is used to timestamp all updated data that is durably stored when the transaction is committed (**Lomet** Abstract).

**"determining whether the intersection is empty or not**

**if the intersection is not empty, scheduling execution of the received query against the database on the basis of the determined intersection"** as if all the cohorts to a transaction vote to commit the transaction and the intersection of the voted time ranges is not empty, then the transaction is committed during the second phase of the protocol. Also a transaction time is selected from the intersection of the voted time ranges, and this selected transaction time is used to timestamp all updated data that is durably stored when the transaction is committed (**Lomet** Col 2 Lines 7-14). In these lines if the intersection time is not empty then the required operation is being performed.

**"if the intersection is empty, notifying a user"** if timestamp ranges voted by the cohorts to a transaction are not sufficiently large, the probability that their

intersection is empty, forcing the transaction to abort, increases (**Lomet** Col 9, Lines 16-19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Lomet's** teaching would have allowed **Snodgrass and Rubert** to facilitate determining the overlap in time of different timeframes, without hurting the system's performance and also providing a delay lock mechanism (**Lomet** Col 1, Lines 50-58).

Claim 28 is essentially the same as claim 9 except it sets forth the claimed invention as a computer readable medium containing a program and is rejected for the same reasons as applied hereinabove.

With respect to claim 13, **Snodgrass** does not explicitly teach **the method of claim 12, wherein the monitored system parameters comprise at least one of:**

**a peak query workload time period**

**a light query workload time period**

**a time pattern indicating availability of the database.**

However, **Lomet** discloses **the method of claim 12, wherein the monitored system parameters comprise at least one of:**

**a peak query workload time period**

**a light query workload time period**

**"a time pattern indicating availability of the database"** as a multiversion database is one, which can be queried (i.e., asked or interrogated) as to what the state of the database was at a specified time. In such multiversion databases, also called temporal databases, all updated data is "stamped" with a time value, usually with a time value corresponding to the time at which the data was updated. With the appropriate support (i.e., software), a query of the timestamped database can provide a transaction consistent view of the database, as it existed at a specified time (**Lomet** Col 1, Lines 13-24). Therefore a specific time/time pattern indicate the availability/existence of a database.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Lomet's** teaching would have allowed **Snodgrass and Rubert** to enhance the performance of the system by using the delay lock mechanism (**Lomet** Col 2, Lines 40-46), which keeps the record of state of database (availability of database) at specified times.

Claims 18, 32, and 37 are same as claim 13 except claims 32 and 37 set forth the claimed invention as a computer readable medium containing a program ands are rejected for the same reasons as applied hereinabove.

With respect to claim 14, **Snodgrass** does not explicitly teach **"the method of claim 13, wherein the database includes distributed data sources and wherein a**

**separate time pattern is provided for each distributed data source, the separate time pattern indicating availability of a corresponding distributed data source."**

However, **Lomet** discloses **"the method of claim 13, wherein the database includes distributed data sources and wherein a separate time pattern is provided for each distributed data source, the separate time pattern indicating availability of a corresponding distributed data source"** as a multiversion database is one, which can be queried (i.e., asked or interrogated) as to what the state of the database was at a specified time. In such multiversion databases, also called temporal databases, all updated data is "stamped" with a time value, usually with a time value corresponding to the time at which the data was updated. With the appropriate support (i.e., software), a query of the timestamped database can provide a transaction consistent view of the database, as it existed at a specified time (**Lomet** Col 1, Lines 13-24). Therefore a specific time/time pattern indicate the availability/existence of a database.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Lomet's** teaching would have allowed **Snodgrass and Rubert** to enhance the performance of the system by using the delay lock mechanism (**Lomet** Col 2, Lines 40-46), which keeps the record of state of database (availability of database) at specified times.

Claims 19, 33, and 38 are same as claim 14 except claims 33 and 38 set forth the claimed invention as a computer readable medium containing a program ands are rejected for the same reasons as applied hereinabove.

***Response to Arguments***

5. Applicant's arguments filed on 01/04/2007 have been fully considered but they are not persuasive.

Applicant argues that **Snodgrass or Rubert** do not teach **"a query execution schedule that defines query eligibility criteria and a timeframe for executing queries satisfying the criteria or scheduling a time to execute a received query on the basis of the timeframe."**

In response to the preceding arguments examiner respectfully submits that **Snodgrass** teaches **"a query execution schedule that defines query eligibility criteria identifying specific queries"** as means for selecting, according to a criteria, which query plan to be used when processing a query, said criteria being based on the result from said cost calculating means (**Snodgrass** Paragraph 0016) **"and a timeframe available for executing the specific queries"** as means for estimating the cost in processing resources according to each said query plan by estimating the selectivity of a temporal selection, said estimate of the selectivity intended for being

performed by using the information that an end time of a period never precedes a start time of the period (**Snodgrass** Paragraph 0020).

**"scheduling a time to execute the received query on the basis of the at least one query execution schedule"** as a set of candidate algebraic query plans is produced by means of the optimizer's transformation rules and heuristics. Next, the optimizer considers in more detail each of these plans. For each algebraic operation in a plan, it assumes that each of the algorithms available for computing that operation is being used, and it estimates the consequent cost of computing the query. This way, one best physical query execution plan, where all operations are specified by algorithms, is found for each original candidate plan (**Snodgrass** Paragraph 0028). Therefore one of the best plan/schedule is being chosen for the execution of a query.

**Snodgrass** teaches the elements above but does not explicitly teaches, **"scheduling a time to execute the received query on the basis of the timeframe of at least one query execution schedule."**

However, **Rubert** discloses **"scheduling a time to execute the received query on the basis of the timeframe of at least one query execution schedule"** as the types of database queries which the user is authorized to execute, provides an interface with which the user can easily specify a query, schedules the time for query execution, executes the specified query if necessary and appropriate at the scheduled time, and notifies users of the results of the execution (**Rubert** Col 4, Lines 2-7).

Further, **Rubert** teaches the **"timeframe"** as specified time periods, which examiner interprets as the timeframes and queries are executed within those specifies time periods.

Further, applicant argues that there is no suggestion or motivation to modify the reference or to combine the reference teachings.

In response to the preceding arguments examiner respectfully submits that **Snodgrass** teaches an invention to optimize the generation and selection of query plans in order to even further optimize the cost-efficiency.

On the other hand **Rubert** provides a scheduler, which allows the user to schedule the query execution time.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Rubert's** teaching would have allowed **Snodgrass** to provide an efficient retrieval of information from one of several databases and to provide efficient query execution by automatically performing the query execution and notifying the user of the query results.

Therefore the combination of the query execution plan of the Snodgrass and the scheduler for executing the queries of Hubert provides the desired results of the claimed invention.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Usmaan Saeed whose telephone number is (571)272-4046. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (571)272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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March 8, 2007

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